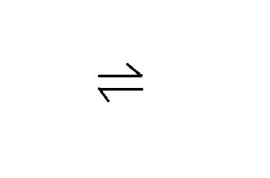
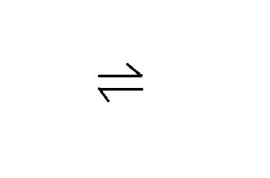
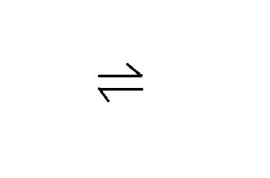
**The Galvanic Cell**

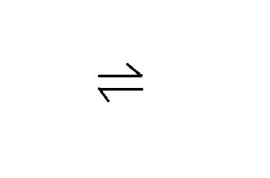
***Prelab***

In this lab, you will be measuring the potential differences of galvanic cells made up of different metal/metal solutions. Each metal/metal solution will be tested with each of the other metal/metal solutions. The half reactions of the metal/metal solutions involved are as follows:

Pb2+ + 2e -  Pb(s) Eo = -0.13

Cu2+ + 2e-  Cu(s) Eo = +0.34

Zn2+ + 2e-  Zn(s) Eo = -0.76

Fe3+ + 3e-  Fe(s) Eo = -0.03

Identify which solution favors reduction and label it as the anode (hint, the more negative the Eo, the more it favors the backwards reaction):

|  |  |  |
| --- | --- | --- |
| Metal/Metal solution | Metal/Metal solution | Anode |
| Zinc/Zn(NO3)2 | Copper/Cu(NO3)2 | *Zinc* |
| Copper/Cu(NO3)2 | Lead/Pb(NO3)2 | *Lead* |
| Copper/Cu(NO3)2 | Iron/FeCl3 | *Iron* |
| Zinc/Zn(NO3)2 | Lead/Pb(NO3)2 | *Zinc* |
| Zinc/Zn(NO3)2 | Iron/FeCl3 | *Zinc* |
| Iron/FeCl3 | Lead/Pb(NO3)2 | *Lead* |

Write the following cell notations for the 6 different cells:

|  |  |
| --- | --- |
| Zinc/Zn(NO3)2 | Copper/Cu(NO3)2 |

*Cu(s)׀Cu(NO3)2(aq)׀׀Zn(NO3)2(aq)׀Zn(s)*

|  |  |
| --- | --- |
| Copper/Cu(NO3)2 | Lead/Pb(NO3)2 |

*Cu(s)׀Cu(NO3)2(aq)׀׀Pb(NO3)2(aq)׀Pb(s)*

|  |  |
| --- | --- |
| Copper/Cu(NO3)2 | Iron/FeCl3 |

*Cu(s)׀Cu(NO3)2(aq)׀׀FeCl3(aq)׀Fe(s)*

|  |  |
| --- | --- |
| Zinc/Zn(NO3)2 | Lead/Pb(NO3)2 |

*Pb(s)׀Pb(NO3)2(aq)׀׀Zn(NO3)2(aq)׀Zn(s)*

|  |  |
| --- | --- |
| Zinc/Zn(NO3)2 | Iron/FeCl3 |

*Fe(s)׀FeCl3(aq) ׀׀Zn(NO3)2(aq)׀Zn(s)*

|  |  |
| --- | --- |
| Iron/FeCl3 | Lead/Pb(NO3)2 |

*Pb(s)׀Pb(NO3)2(aq)׀׀Pb(NO3)2(aq)׀Pb(s)*

***Safety***

Fill in the following table with the safety material found in the MSDS sheets provided.

NOTE: This table MUST be completed before the lab!

|  |  |  |  |
| --- | --- | --- | --- |
| Compound | Toxicology/Hazard | First Aid | Fire Hazards |
| Pb(NO3)2 | *Answers will vary*  *Please refer to MSDS sheets provided by the teacher* | *Answers will vary*  *Please refer to MSDS sheets provided by the teacher* | *Answers will vary*  *Please refer to MSDS sheets provided by the teacher* |
| Cu(NO3)2 | *Answers will vary*  *Please refer to MSDS sheets provided by the teacher* | *Answers will vary*  *Please refer to MSDS sheets provided by the teacher* | *Answers will vary*  *Please refer to MSDS sheets provided by the teacher* |
| Zn(NO3)2 | *Answers will vary*  *Please refer to MSDS sheets provided by the teacher* | *Answers will vary*  *Please refer to MSDS sheets provided by the teacher* | *Answers will vary*  *Please refer to MSDS sheets provided by the teacher* |
| KNO3 | *Answers will vary*  *Please refer to MSDS sheets provided by the teacher* | *Answers will vary*  *Please refer to MSDS sheets provided by the teacher* | *Answers will vary*  *Please refer to MSDS sheets provided by the teacher* |
| FeCl3 | *Answers will vary*  *Please refer to MSDS sheets provided by the teacher* | *Answers will vary*  *Please refer to MSDS sheets provided by the teacher* | *Answers will vary*  *Please refer to MSDS sheets provided by the teacher* |